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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/810,019

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08/21/2008

EXAMINER

CREPEAU, JONATHAN

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

08/21/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/810,019	Applicant(s) WEST ET AL.	
	Examiner Jonathan S. Crepeau	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,9,10,12-14,16,17,19-24,26,27 and 55-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,9,10,12-14,16,17,19-24,26,27 and 55-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1, 3-5, 9, 10, 12-14, 16, 17, 19-24, 26, 27, and 55-61. The claims are newly rejected under 35 USC 102 and 103, but these rejections were not necessitated by amendment. As such, this action is non-final.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3, 9, 12, 21, 22, 24, 26, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Spiegel et al (U.S. Patent 6,447,952). The reference is directed to a chain-extended or crosslinked polysiloxane electrolyte for a lithium secondary battery (see abstract). The polysiloxane may comprise cyclic carbonate moieties on a terminal silicon thereof (see col. 4 line 25, col. 20, line 30). Regarding claim 9, each terminal silicon may comprise the carbonate moiety (see col. 3, line 40). Regarding claim 12, an oxygen may link the carbonate moiety to the terminal silicon (see col. 3, line 67). Regarding claim 21, as is apparent from the general formulas, the polysiloxane may have a molecular weight of less than 3000. Regarding claim 22, the ratio of alkali metal ions to cyclic carbonate groups is 1:30 to 1:5 (see col. 5, line 37). Since there are three "active oxygens" per carbonate group (see [0027] of instant specification), the

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ratio of [O]/[Li] is 15:1 to 90:1, which anticipates the claimed range. Regarding claim 24, the electrolyte is solid (see col. 5, line 52). Regarding claim 26, the polysiloxane is a member of an interpenetrating network. Regarding claim 27, the electrolyte has a conductivity of 10^{-4} or 10^{-2} S/cm or higher (see col. 3, line 15). Thus, the instant claims are anticipated.

Claim Rejections - 35 USC § 103

4. Claims 4, 5, 10, 13, 14, 16, 17, 19, 20, 23, and 55-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spiegel et al. in view of Lersch et al (U.S. Patent 5,606,077).

Spiegel et al. is applied to claims 1, 3, 9, 12, 21, 22, 24, 26, and 27 for the reasons stated above. However, the reference does not expressly teach terminal or middle silicons comprising a poly(alkylene oxide) moiety, as recited in claims 4, 10, 13, and 55.

Lersch et al. is directed to a polysiloxane having terminal silicons linked to cyclic carbonate moieties ("R2") and/or polyalkylene oxide moieties ("R5" / "R1") (see column 2; in particular the general formula and lines 20-29 and 60). Additionally, each silicon atom in the polymer backbone may have a cyclic carbonate and/or polyalkylene oxide moiety attached to it. The moieties may also contain an oxygen atom that is bonded to the silicon in the backbone (see col. 7, line 40).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the substitution of one known element (the polymer of Lersch et al.) for another (the polymer of Spiegel et al.) would have yielded predictable results to one of ordinary skill in the art. It is submitted that the use of the polymer

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of Lersch et al. in the battery of Spiegel et al. would have provided the predictable result of a polysiloxane electrolyte having a high ionic conductivity. In column 5, Lersch et al. teach that their polymer has a high polarity, which is a result of the plurality of carbonate and polyalkylene oxide side chains containing active oxygen sites. Further, as disclosed in col. 3, line 6 of Spiegel et al., the carbonate moieties allow the polymer of Spiegel et al. to have a high ionic conductivity. Thus, the skilled artisan can conclude from these disclosures that the increased use of polar moieties having active oxygen sites would increase the polarity and ionic conductivity of a particular polysiloxane. Accordingly, this provides motivation to use the polysiloxane of Lersch et al. as the electrolyte of Spiegel et al.

It is further noted that the Lersch patent contains a citation to an article by Zhu et al. on the front of the patent. The Zhu et al. citation is specifically directed to the ionic conductivity of polysiloxanes containing carbonate side chains, which suggests the use of the polysiloxanes in a battery or other electrochemical device. This provides further evidence that the polymer of Lersch et al. would be suitable for use as an electrolyte in a battery such as that of Spiegel et al. Additionally, Lersch et al. teach that the polymers may be used for “electronic applications” in column 5, line 14.

Regarding claim 23, it would be obvious to use the polymer of Lersch et al. in either a liquid or solid form in the battery of Spiegel et al. The disclosure in column 5 of Lersch et al. indicates that the polymers are useable in liquids, and it would be obvious to employ them as part of a gelled system containing liquid in the battery of Spiegel et al.

Regarding claims 13, 14, 16, 17, 19, 20, and 55-61, which recite specific formulas with cross linkages, it is submitted that this subject matter would also be obvious to the skilled artisan.

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It is noted that the claimed formulas have a high degree of similarity to the general formula disclosed by Lersch et al., and the polymers of Lersch et al. may be routinely modified to result in polymers encompassed by the claimed formula. Furthermore, regarding the cross linkages (indicated as R4 in the instant claims), it would be obvious to perform cross-linking on the polymer of Lersch et al. Cross-linking is specifically disclosed in the Spiegel et al. reference and is known to increase strength and molecular weight of a material, the former being particularly valuable in a solid electrolyte. Accordingly, the artisan would be motivated to cross-link the polymer of Lersch et al.

Response to Arguments

5. Applicant's arguments filed May 12, 2008 have been fully considered but they are not persuasive insofar as they apply to the present rejections. Applicants argue that Lersch et al. is nonanalogous art since its "field of endeavor could be characterized as additives for dispersion paints or lacquers." However, it is submitted that the reference teaches that the polymers are useful for electronic devices, as stated in the rejection, and furthermore, the Zhu citation on the front of the patent clearly suggests an electrochemical application. In addition, the disclosure of Lersch et al. would have commanded itself to an inventor's attention when considering the problem of how to increase ion conductivity of polysiloxane electrolytes. Thus, the reliance on the Lersch et al. reference in the 35 USC 103 rejection above is believed to be proper.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jonathan Crepeau/
Primary Examiner, Art Unit 1795
August 22, 2008